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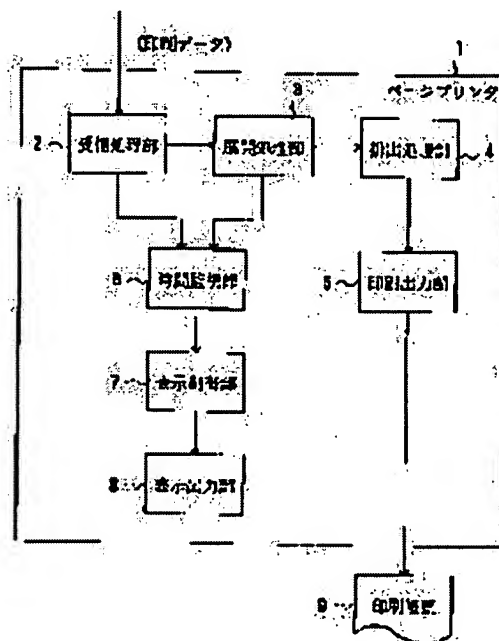
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## (54) PAGE PRINTER AND METHOD OF INDICATING OPERATION OF PAGE PRINTER

### (57)Abstract:

**PURPOSE:** To allow a printer to be used safely by processing printing data per page, and understanding processing conditions of printing with respect to the printer page to be print-outputted and a method of representing the operation of page printer.

**CONSTITUTION:** The page printer 1 includes a receiver for receiving coded printing data, a development processor 3 for development-processing printing data in bit map data per page, and a printing out part for print-outputting the developed bit map data, and also it is provided with a time monitoring part 6 for monitoring an elapsed time of print processing and a representation outputting part 8, and has constitution for representing an elapsed information of the print-processing from the receiving of coded printing data.



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CLAIMS

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[Claim(s)]

[Claim 1] The page printer characterized by to have the time-amount Monitoring Department and the display-output section which supervise the elapsed time of printing processing in the page printer which carries out the printout of the bit map data which developed the reception section which receives the print data of a code, and these print data to bit map data for every page with the expansion processing section which carries out expansion processing, and to display the progress information on printing processing from reception of the print data of a code.

[Claim 2] As opposed to the termination event of the blowdown processing for every page of bit map data by which expansion processing was carried out with the termination [ of the reception for every page of this reception section ], and termination event of the expansion processing for every page of this expansion processing section The page printer according to claim 1 characterized by defining fixed progress information, judging the elapsed time from each start time based on the criteria elapsed time made into the criteria which judge the elapsed time in reception, expansion processing, and blowdown processing, and displaying progress information.

[Claim 3] The action indication approach of the page printer characterized by displaying the progress information as which progress of printing processing is expressed after receiving the print data of a code, having the time amount Monitoring Department and the display which supervise the elapsed time of printing processing in the action indication approach of the page printer which carries out expansion processing, and which carries out a printout to bit map data and receiving the print data of a code.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the action indication approach of the page printer which processes print data per page and carries out a printout, and a page printer.

[0002] The print data of a 1-page code are changed into bit map data, it develops to a page buffer, and page printers, such as a laser beam printer, carry out printing processing per page.

[0003] This invention displays the information which shows progress of printing processing in such a page printer.

[0004]

[Description of the Prior Art] Drawing 6 (a), drawing 6 (b) shows the conventional page printer.

Drawing 6 (a), drawing 6 In (b), 100 is a page printer.

[0005] 110 is the reception section and receives the print data of the code transmitted from a host computer. 111 is the expansion processing section, changes the print data of a code into the data (bit map data are called henceforth) of a dot unit per 1 page (it is the case of the unit which divided 1 page, such as 1/2 unit), and carries out expansion processing at a page buffer (not shown).

[0006] 112 is the blowdown processing section and transmits the developed bit map data to the printout section 113. 113 is the printout section and carries out the printout of the bit map data to paper.

[0007] 114 is a display and control section and performs the display control of the issuance diode 115 and liquid crystal display section 116 grade. 115 is issuance diode, and turns on or blinks between printing processings.

[0008] 116 is the liquid crystal display section and displays "in SATSUCHU" etc. during printing processing. Drawing 6 Explain actuation of (a).

[0009] The reception section 110 receives the print data of a code from a host computer (not shown). The expansion processing section 111 changes into the print data of a bit map the print data of a code which the reception section 110 received, and carries out expansion processing at a page buffer (graphic display \*\*\*\*). The blowdown processing section 112 transmits the print data of the bit map developed by the page buffer to ejection and the printout section 113. The printout section 113 carries out the printout of the print data of a bit map to paper.

[0010] A display and control section 114 indicates the issuance diode 115 by flash after starting reception of the print data of a code until blowdown of bit map data is completed. Drawing 6 In (b), a display and control section 114 erases the display under printing, after displaying "in SATSUCHU" that the reception section 110 starts reception of the print data for 1 page on the liquid crystal display section 116 and completing blowdown of bit map data by the blowdown processing section 112. It is drawing 6 except actuation of this point. It is the same as that of actuation of (a).

[0011]

[Problem(s) to be Solved by the Invention] The conventional page printer did not find progress of operation until blowdown of bit map data was completed from reception of the print data of a code for every 1-page processing, it required time amount and blowdown of the printed paper was made.

Therefore, about during this period, he blinks issuance diode as mentioned above conventionally, or was trying to display "in SATSUCHU" on the liquid crystal display section. However, although it turned out that the conventional display is [ printing ] under processing, the processing was not able to progress to how much and it has not grasped whether the remainder can end printing by the time amount of which about. Therefore, decision might not attach by how much time amount processing going smoothly or the remainder would be completed, but the conventional page printer might give the user anxiety.

[0012] This invention can hold the progress situation of printing and aims at reaching the page printer which can be used in comfort and offering the action indication approach of a page printer.

[0013]

[Means for Solving the Problem] In the page printer which carries out the printout of the bit map data which developed the receive section which receives the print data of a code, and these print data to bit map data for every page with the expansion processing section which carries out expansion processing, this invention is equipped with the time amount Monitoring Department and the display-output section which supervise the elapsed time of printing processing, and displayed the progress information on printing processing from reception of the print data of a code.

[0014] Drawing 1 shows the basic configuration of this invention. In drawing 1, 1 is a page printer.

[0015] 2 is the reception section and receives the print data of a code from a host computer. 3 is the expansion processing section and develops the print data of a code to bit map data per page (it contains, also when dividing 1 page, such as 1/2 etc. page, into plurality).

[0016] 4 is the blowdown processing section, takes out the bit map data developed per page, and transmits them to the printout section 5. 5 is the printout section and carries out the printout of the bit map data.

[0017] 6 is the time amount Monitoring Department and supervises progress of printing processing. 7 is a display and control section and supervises the display-output section 8. 8 is the display-output section and displays the progress information on printing processing.

[0018]

[Function] Actuation of the basic configuration of this invention of drawing 1 is explained. The reception section 2 will notify the time amount Monitoring Department 6 of reception initiation of print data for every page, if reception of the print data of a code is started. The time amount Monitoring Department 6 notifies the reception initiation for every page to a display and control section 7, and supervises the elapsed time of reception. And whenever fixed time amount (monitor conventional time) passes since reception initiation of a page, progress of the monitor conventional time is notified to a display and control section 7.

[0019] A display and control section 7 carries out the display control of the display-output section 8, and the display-output section 8 displays the progress information on processing by for example, % display or a bar graph display, fraction display (% is expressed with a fraction), etc. for every progress of the reception initiation for every page, and the monitor conventional time.

[0020] Initiation of the expansion processing by the expansion processing section 3 notifies initiation of expansion processing of the time amount Monitoring Department 6. The time amount Monitoring Department 6 notifies initiation of expansion processing to a display and control section 7, and supervises the elapsed time from initiation of expansion processing. And the time amount Monitoring Department 6 notifies progress of expansion processing for every progress of fixed time amount (monitor conventional time) from initiation of the expansion processing to a display and control section 7. And a display and control section 7 controls the display-output section 8, and the display-output section 8 displays progress information by for example, % display or the bar graph, fraction display, etc. for every initiation of expansion processing, and progress of the monitor conventional time.

[0021] Next, if the blowdown processing section 4 starts blowdown processing (bit map data transfer processing to the printout section 5) after the expansion processing section 3 ends expansion of the bit data for 1 page, the time amount Monitoring Department 6 will be notified of initiation of blowdown processing. The time amount Monitoring Department 6 notifies initiation of blowdown processing to a display and control section 7, and supervises the elapsed time of blowdown processing. And whenever

fixed time amount (monitor conventional time) passes since initiation of blowdown processing, time amount progress is notified to a display and control section 7. A display and control section 7 performs the display control of the display-output section 8, and, as for the display-output section 8, the monitor conventional time of initiation of blowdown processing and blowdown processing displays progress information by for example, % display or the bar graph, fraction display, etc. for every progress.

[0022] In addition, when printing processing includes several pages, generally, the reception of the print data of the following page is started by blowdown processing initiation and coincidence, and blowdown processing of the 1st page and the page [ 2nd ] reception are performed in parallel (if the processing time for 1 page of reception is brief, expansion processing will also be performed in parallel). When displaying by % there, the display of the display-output section after "100%" display of the 1st page will be the display according to the progress situation of the reception or expansion processing of the 2nd page at that time. When there are subsequent pages, it carries out similarly.

[0023] According to this invention, a user can check the progress situation from print-data reception of a page printer to blowdown of bit map data by the display of the display-output section for every page. Therefore, since it can grasp whether printing processing is going smoothly or how much the residual time of processing is, a user's anxiety over printing processing can be abolished.

[0024]

[Example] Drawing 2 is the example configuration of this invention. In drawing 2, 50 is a host computer.

[0025] 51 is a page printer. 52 is the reception section. 53 is a data buffer and holds the print data of a code.

[0026] 54 is the expansion processing section. 55 is a page buffer and holds the bit map data developed in the expansion processing section 54.

[0027] 56 is the blowdown processing section. 57 is the paper-size judging section and judges the paper size to print.

[0028] 58 is the printout section (print station section), and carries out the printout of the bit map data for every page. 59 is a printing document.

[0029] 60 is the time amount Monitoring Department. 61 is a timer. 62 is a time amount table and holds the reference value (monitor conventional time t1) made into the break of the elapsed time of reception, the reference value (monitor conventional time t2) made into the break of the elapsed time of expansion processing, and the reference value (monitor conventional time t3) made into the break of the elapsed time of blowdown processing.

[0030] 63 is a display and control section. 64 is the display-output section. Actuation of drawing 2 is explained with reference to drawing 3.

[0031] Drawing 3 is the explanatory view of the example of this invention of operation, and shows as an example the case which does % display of time amount progress of printing where a case and a bar graph indication are given. In drawing 3, 81 shows progress of printing processing.

[0032] 82 does % display of the time amount progress information on printing processing. 83 indicates the time amount progress information on printing processing by the bar graph. In drawing 2, the print data of a code are transmitted to a page printer 51 from a host computer 50. If the print data of a code are received, the reception section 52 will notify the time amount Monitoring Department 60 of initiation of reception, and will hold the print data of a code to a data buffer 53. The time amount Monitoring Department 60 is the monitor conventional time t1 corresponding to the paper size of the time amount table 62 by the timer 61. It refers to and the elapsed time from reception initiation is supervised. And the monitor conventional time t1 Time amount progress is notified to a display and control section 63 for every progress. A display and control section 63 carries out the display control of the display-output section 64, and the display-output section 64 is 0% display and time amount t1 at the time of reception initiation. 10% and 20% of indication is given for every progress.

[0033] If the data for 1 page are stored in a data buffer 53, the expansion processing section 54 will notify the time amount Monitoring Department 60 of initiation of expansion processing, will change the print data of the code of a data buffer 53 into bit map data, and will develop them to a page buffer 55.

The meantime and time amount Monitoring Department 60 is the monitor conventional time t2 corresponding to the paper size of the time amount table 62 by the timer 61. It refers to and the elapsed time of expansion processing is supervised. And the monitor conventional time t2 It notifies to a display and control section 63 for every progress. A display and control section 63 carries out the display control of the display-output section 64, and the display-output section 64 is initiation and the monitor conventional time t2 of expansion processing. 40%, 50%, and 60% of display is performed for every progress.

[0034] After expansion processing of the bit map data for 1 page is completed, the blowdown processing section 56 notifies the time amount Monitoring Department 60 of initiation of blowdown processing, and transmits the print data of the bit map developed by the page buffer 55 to the printout section 58. In the meantime, the time amount Monitoring Department 60 supervises the elapsed time from blowdown initiation with a timer 61 with reference to the monitor conventional time t3 corresponding to the paper size of the time amount table 62. And the monitor conventional time t3 It notifies to a display and control section 63 for every progress. The display control of the display-output section 64 is performed, the display-output section 64 gives 80% of indication at the time of initiation of blowdown processing, and a display and control section 63 is the monitor conventional time t3. 90% of display is performed for every progress. And it is t3 further. 100% of display is performed after progress.

[0035] In addition, you may make it drawing 3 express time amount progress for time amount progress of printing processing as the die length of a bar graph like the bar graph presenting 83 of the time amount progress information on drawing 3. Moreover, you may make it a fraction display instead of % display.

[0036] Drawing 4 and drawing 5 are the flow charts of the example of this invention, and are a flow chart in the case of carrying out % display about the progress information on printing processing.

S1 The reception section 52 starts reception.

[0037] S2 The time amount Monitoring Department 60 is started.

S3 0% is displayed on the display-output section (LCD) 64.

S4 The reception section 52 carries out reception.

[0038] S5 It judges whether the data (print data) of the part which can start all data (print data) or expansion processings were received. If the print data of the part which can start expansion processing are received, it will progress to S9, and if the print data of the part which can start expansion processing are not received, it will progress to S6.

[0039] S6 Predetermined time amount t1 (monitor conventional time) It judges whether it passed. Predetermined time amount t1 If it has passed, it progresses to S7, and if it has not passed, the processing after S4 will be repeated.

[0040] S7 Predetermined time amount t1 It passes, whenever it goes into LCD display modification routine \*\*, it displays in 10% and 20% of order, and it does not increase more than it.

S8 The time amount Monitoring Department 60 is reset. Henceforth, the processing after S4 is repeated.

[0041] S9 If the reception section 52 receives all data or the data of a part which can carry out expansion processing, the expansion processing section 54 will start expansion processing.

S10 The time amount Monitoring Department 60 is reset.

[0042] S11 30% is displayed on the display-output section (LCD) 64.

S12 Expansion processing is carried out.

S13 It judges whether expansion processing was completed. If expansion processing is not completed, and it progressed to S14 and has ended, it will progress to S17 ( drawing 5 ).

[0043] S14 Predetermined time amount t2 (monitor conventional time) It judges whether it passed.

Predetermined time amount t2 If it passes, it progresses to S15, and if it has not passed, the processing after S12 will be repeated.

[0044] S15 Predetermined time amount t2 It passes, whenever it goes into LCD display routine \*\*, it displays in 40%, 50%, 60%, and 70% of order, and it does not increase more than it.

S16 The time amount Monitoring Department 60 is reset. Henceforth, the processing after S12 is repeated.

[0045] S17 If the expansion processing to a page buffer 55 is completed, the blowdown processing section 56 will start blowdown of the print data of a page buffer 55.

S18 The time amount Monitoring Department 60 is reset.

[0046] S19 80% is displayed on the display-output section (LCD) 64.

S20 Blowdown processing is carried out.

S21 It judges whether blowdown processing was completed. If it has not ended, and progressed to S22 and has ended, it will progress to S25.

[0047] S22 If blowdown processing is not completed, it is the predetermined time amount (monitor conventional time) t3. It judges whether it passed. Predetermined time amount t3 If it has not passed, the processing after S20 is repeated, and if it has passed, it will progress to S23.

[0048] S23 The predetermined monitor conventional time t3 If it has passed, whenever it will go into a LCD display modification \*\* routine, it displays in 90% and 100% of order, and it does not increase more than it.

S24 The time amount Monitoring Department 60 is reset. Henceforth, the processing after S20 is repeated.

[0049] S25 If blowdown processing of the blowdown processing section 56 is completed, the display of the display-output section (LCD) 64 will be returned to the usual condition.

[0050]

[Effect of the Invention] In the conventional page printer, the user was not able to know to what extent the processing would progress to the blowdown of bit data by which expansion processing was carried out from reception of print data. According to this invention, a user can know progress of printing processing. Therefore, according to this invention, examination of printing processing going smoothly or the time amount which the remaining processing takes being how much can be attached, and printing processing can be performed in comfort.

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[Translation done.]